

# L3 Muon Filter: Status (1)

- A first version of the L3 muon filter is in p11
- The code in CVS is unchanged since December 2001
- There are a couple of known bugs in this release.
- These bugs affect mostly 'loose' and 'tight' muons.
- Two of the bugs affect only a certain part of the **detector** ( $\Rightarrow$  bias).
- With the present release version the 'loose' efficiency for single muons is approx. 50–60%.

## L3 Muon Filter: Status (2)

- ☞ The **bugs** are (hopefully) **fixed**, but **not yet in a software release.** (Aim: Include them in p11.02)
- ☞ The changed files which affect the **offline reconstruction** are also beeing tested with **RecoAnalyze**.
- ☞ **A memory leak was identified and fixed** by Boris Tuchming (but it's still not clear if *this* was the *essential* leak.)
- ☞ Unless the new unpacking tool is certified, the **configuration file has to be changed** each time a readout module fails. (N.B.: A wrong configuration file does *not* affect the recorded data, it only produces a dead region for the L3 muon trigger).

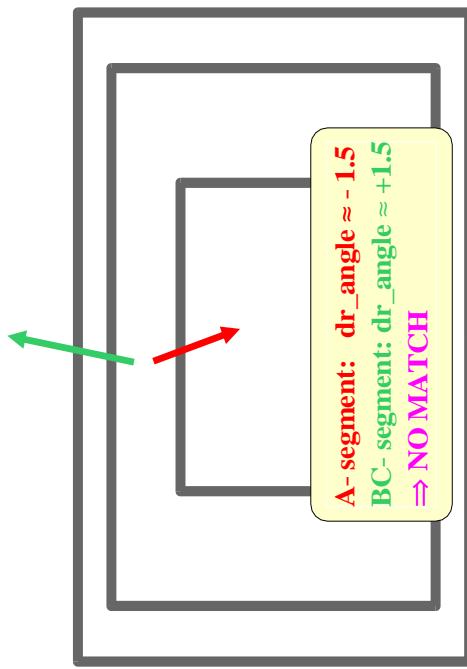
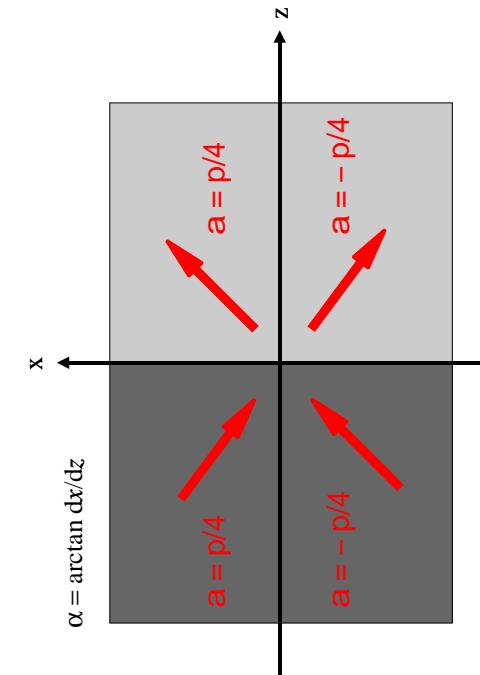
# L3 Muon Filter: The bugs

1. Due to a sign error segments in the north MDTs are always mirrored at the x- or y-axis.
2. Some segments are assigned to a wrong octant, because the "Segment" class doesn't contain this information explicitly.
3. Since the  $\eta$  angle doesn't respect the direction of the tracks, some pairs of segments are not matched.
4. In case of ambiguities in the reconstruction sometimes the wrong candidate is taken. (Criterion is only the  $\chi^2$  of the segment, not e.g. the angle.)
5. As the determination of the hit coordinate along the wire doesn't work properly, some A and BC segments are not combined because of a too tight  $\phi$  cut.

# The "dr\_angle" problem"

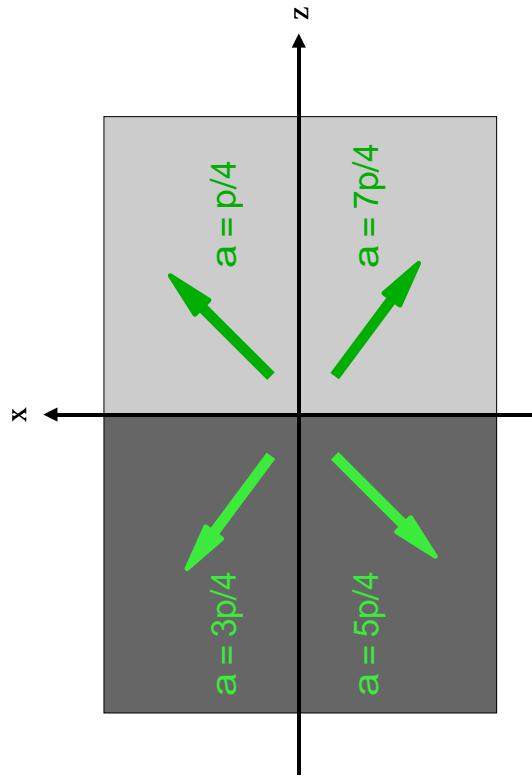
Old definition of "dr\_angle":

Problem:



# The solution

New definition of "dr\_angle":



# Something is different now...

✖ Fraction of found muons:

✖ Single muon Monte-Carlo:

$$47\% \rightarrow 74\%$$

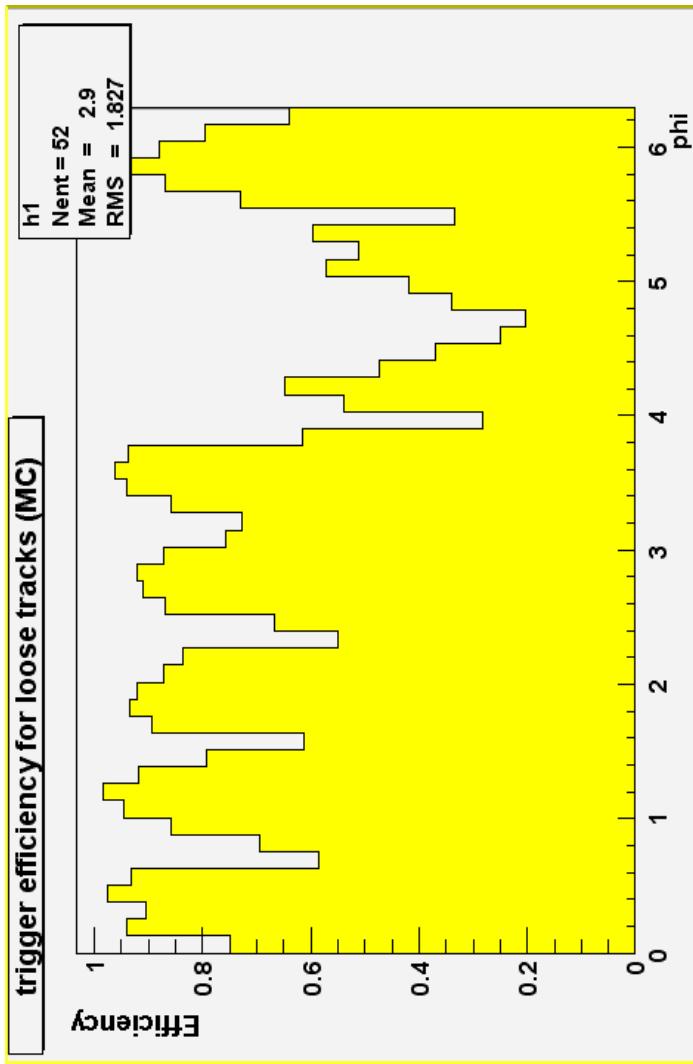
(no corrections for acceptance within  $\eta = -2 \dots 2$ )

✖ Offline selected di-muon events:

$$\approx 60\% \rightarrow 86\%$$

(Here some hits are lost due to a changing hardware configuration)

Well, I think, it looks good...



- Single Muon 5GeV MC eta and phi uniform
- Trigger for loose muon, no  $p_T$  cut
- Efficiency = generated tracks / tracks with fired L3 bit